C. Acceptance

Test as follows:

Test	Method
Soil gradation	GDT 4
Liquid Limit	AASHTO T 89
Plastic Limit and Plastic Index	AASHTO T 90

D. Materials Warranty

General Provisions 101 through 150.

Section 815—Graded Aggregate

815.1 General Description

This section includes the requirements for material to be used for base, subbase, or shoulder course material, and includes graded aggregate, unconsolidated limerock base, and crushed concrete base.

815.1.01 Related References

A. Standard Specifications

Section 800—Coarse Aggregate

B. Referenced Documents

AASHTO T 27

ASTM C 295

ASTM D 3042

FL DOT Method FM5-515

SOP–1

GDT 63

815.2 Materials

815.2.01 Graded Aggregate

A. Requirements

1. Type

   Use graded aggregate base, subbase, or shoulder course material of uniform quality.

   a. Obtain the graded aggregate from an approved source or deposit that will yield a satisfactory mixture meeting all requirements of this Specification.

   b. Use material that is crushed or processed as a part of the mining operations, or, mix two grades of material so that when combined in the central mix plant, the mixture meets the specifications.

2. Retained on the No. 10 (2 mm) sieve

   Ensure that the material retained on the No. 10 (2 mm) sieve is Class A or B aggregate that meets the requirements of Section 800.

3. Passing the No. 10 (2 mm) sieve

   Ensure that any material passing the No. 10 (2 mm) sieve is relatively free of detrimental substances, such as soil overburden, decomposed rock, and/or swelling silts.

4. Stabilized Mixtures

   Ensure that mixtures to be stabilized react satisfactorily when mixed with Portland cement. The Engineer will specify the percentage of Portland cement to use.

5. Gradation

Grade the graded aggregate base, subbase, or shoulder material as follows:

Sieve Size	Percent Passing By Weight
Group I Aggregates	
2 in (50 mm)	100
1-1/2 in (37.5 mm)	97-100
3/4 in (19.0 mm)	60-95
No. 10 (2 mm)	25-50 (Note 1, 2 and 3)
No. 60 (250 µm)	10-35
No. 200 (75 µm)	7-15
Group II Aggregates	
2 in (50 mm)	100
1-1/2 in (37.5 mm)	97-100
3/4 in (19 mm)	60-90
No. 10 (2 mm)	25-45 (Note 2 and 4)
No. 60 (250 µm)	5-30
No. 200 (75 µm)	4-11
NOTE 1: Group I aggregates having less than 37% passing the No. 10 (2 mm) sieve, shall have at least 9 percent passing the No. 200 (75 µm) sieve.	
NOTE 2: For graded aggregate stabilized with Portland Cement, 30-50 percent by weight shall pass the No. 10 (2 mm) sieve. All other requirements remain the same.	
NOTE 3: Material passing the No. 10 (2 mm) sieve shall have a sand equivalent of at least 20 for Group I aggregates.	
NOTE 4: Material passing the No. 10 (2 mm) sieve shall have a sand equivalent of at least 28 for Group II aggregates. Sand Equivalent values as low as 20 will be acceptable provided they are attributed exclusively to rock flour and the percent passing the No. 10 (2 mm) sieve does not exceed 40.	

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Gradation	AASHTO T 27
Sand Equivalent	GDT 63

D. Materials Warranty

General Provisions 101 through 150.

815.2.02 Unconsolidated Limerock Base

A. Requirements

1. Type

Use limerock base, subbase, or shoulder course material of uniform quality.

a. To ensure uniform quality, the Department may restrict approved sources to specific mining areas, mining processes at a specific mining site, or both.

b. Use a limerock base that yields a mixture to meet these Specifications.

c. Use material that is crushed or processed as a part of the mining operations, or mix two grades of material so that when combined in the central mix plant the mixture meets the specifications.

d. Use limerock base, subbase, or shoulder material that has the following characteristics:

Limerock bearing ratio	At least 100.
Deleterious substances	Do not allow chert or other extremely hard pieces that will not pass the 2 in (50 mm) sieve. Do not allow clay, sand, organics, or other materials in quantities that may damage bonding, finishing, or strength. All material passing the No. 40 (425 µm) sieve shall be non-plastic.
Carbonate content (magnesium or calcium)	At least 90%.

2. Gradation

Grade the limerock base so at least 97 percent by weight passes the 3-1/2 in (90 mm) sieve.

a. Grade the material uniformly to dust. The fine portion passing the No. 10 (2 mm) sieve shall all be dust of fracture.

b. Crush or break the limerock base, if necessary to meet size requirements before placing the material on the road.

c. Ensure that materials having soundness losses of 20% or less, comply with the following gradation requirements:

Gradation Requirements

SIEVE SIZE	PERCENT PASSINGBY WEIGHT
2” (50 mm)	100
1-1/2” (37.5 mm)	97-100
3/4” (19 mm)	60-95
No. 10 (2.00 mm)	25-45
No. 60 (250 μm)	10-30
No. 200 (75 μm)	7-20

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Gradation	AASHTO T 27
Limerock bearing ratio	FL DOT Method FM5-515
Petrographic analysis	ASTM C 295
Total carbonates (insoluble residue)	ASTM D 3042

D. Materials Warranty

General Provisions 101 through 150.

815.2.03 Crushed Concrete Base

A. Requirements

1. Sources

   Obtain sources of crushed concrete materials approved by the Office of Materials and Research. The criteria for approval will be as outlined in Standard Operating Procedure No. 1, "Monitoring the Quality of Coarse and Fine Aggregates" except that the raw material will be recyclable concrete as specified herein rather than a geological deposit of aggregate.

2. Type

   Use crushed concrete derived exclusively from Portland cement concrete pavement or structural concrete as a base, subbase, or shoulder course.

   Ensure that the material does not contain delivery unit washout material.

3. Gradation

   Ensure that the finished product meets the quality and gradation requirements of Subsection 815.2.01 for Group II aggregates, except that the aggregate will be recycled concrete.

   Ensure that the finished product is free of foreign materials such as asphaltic concrete, steel reinforcement, clay balls, soils, epoxy expansion material, and miscellaneous paving materials.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Gradation	AASHTO T 27
Sand Equivalent	GDT 63

D. Materials Warranty

General Provisions 101 through 150.

815.2.04 Inorganic Mineral Ash

A. Requirements

Inorganic mineral ash base, subbase, or shoulder course material is restricted to use on local roads only and shall not be used on Interstates or State Highway System routes.

1. Sources

   Obtain inorganic mineral ash from an approved source or deposit that will yield a satisfactory mixture meeting all requirements of this Specification after it has been processed or crushed as a part of the mining operations.

   The inorganic mineral ash shall be of uniform quality throughout. To ensure uniformity in quality, approved sources may be restricted to specific mining areas and/or mining processes at a specific mining site.

2. Type

   Ensure inorganic mineral ash base, subbase, or shoulder course material conforms to the following types:

   a. Class C Fly Ash: Class C fly ash is the finely divided residue that results from the combustion of ground or powdered coal and is transported from the boiler by flue gases.

   b. Circulating Fluidized Bed Combustor Ash (CFBC Ash): CFBC ash is the residue that results from the combustion of petroleum coke with the injection of lime or crushed limestone directly into the boiler for sulfur removal and is transported from the boiler by flue gases.

      The CFBC ash shall have a minimum Available Lime Index of 5 percent.

3. Gradation

   Use inorganic mineral ash that has at least 97 percent (by weight) of the material passing a 3 ½-inch (90 mm) sieve and is graded uniformly down to dust.

Perform all crushing or breaking up necessary to meet the size requirements before the material is placed on the road.

A grading range on material being shipped to Department Projects may be established as a guide to verify consistency of the product.

Do not use inorganic mineral ash that contains extremely hard pieces of material retained on the 2-inch (50 mm) sieve when they are considered deleterious to the clipping and finishing of the base material when placed on the roadway.

B. Fabrication

General Provisions 101 through 150.

C. Acceptance

Test as follows:

Test	Method
Sieve Analysis	AASHTO T 27
Class C Fly Ash	AASHTO M 295
Available Lime Index	ASTM C 25

D. Materials Warranty

General Provisions 101 through 150.

Section 816—Soil Aggregate Bases

816.1 General Description

This section includes the requirements for material to be used as soil aggregate base.

816.1.01 Related References

A. Standard Specifications

Section 815–Graded Aggregate

B. Referenced Documents

AASHTO T 89

AASHTO T 90

GDT 4

GDT 6

GDT 7

GDT 13

816.2 Materials

816.2.01 Soil Aggregate

A. Requirements

1. Type

   Use a soil aggregate base, subbase, or shoulder base course material that is of uniform quality.

2. Material Retained on No. 10 (2 mm) sieve

   Ensure the material retained on the No. 10 (2 mm) sieve meets the requirements of Subsection 815.2.01.A.

NOTE: You may substitute Group I graded aggregate base that meets the requirements of Subsection 815.2.01.A for soil aggregate base.